

S P E C I F I C A T I O N

Attorney's

Docket No. **0451M-001**

TO WHOM IT MAY CONCERN:

BE IT KNOWN that I, **LLOYD MOORE**, a citizen of the United States residing in **Fort Worth**, Texas, have invented new and useful improvements in a

GARAGE DOORWAY SCREEN

of which the following is a specification.

BACKGROUND OF THE INVENTION

1. Field of the Invention:

This invention relates generally to doorway accessories, and particularly to accessories for covering openings below partially opened garage doors. More particularly, this invention relates to a net adapted to be stretched from one side of the doorway to the other beneath the garage door.

2. Description of Related Art:

Sectioned garage doors typically employ several horizontal panels hinged together to allow the door to follow a curved track when raised overhead. Such doors are supported on the ends of each panel by rollers which follow an inverted-L shaped track mounted vertically on either side of the door opening. Especially when raised and lowered by an automatic door opener, such garage doors may be stopped at any level above the garage floor, leaving a horizontal opening the width of the doorway beneath the bottom door panel. Owners often use this technique to increase ventilation and light or to permit pets to enter and leave the garage. Unless covered, this opening also may allow unwanted intrusions by pests of various sizes. If the owner wishes to deter such intrusions or to confine small children or pets within the garage for their safety, while providing them with ventilation, light and visual access outdoors, the opening must be covered. Means for conveniently covering such openings while maintaining ventilation, light and visibility would assist such motives.

Numerous prior art devices exist which attempt, but fall short of, the achievements of the present invention. Most attach to the bottom panel of the door and comprise a screen-like extension thereof. Some include rigid frames which couple to the bottom edge of the bottom panel and either hingedly or slidingly retract when the door must be closed. These are heavy, complicated, usually expensive and prone to damage and malfunction. Others rely on the screen material itself for structural integrity and must attach to the garage floor for stability. Such attachments obstruct ingress and egress to the garage, can cause tire damage and can be

1 damaged in turn, causing failure. A need exists for efficient means for covering garage door
2 openings.

3 SUMMARY OF THE INVENTION

4 Accordingly, it is an object of this invention to provide means for covering a gap
5 below the bottom of a garage door that allows ventilation and light into the garage.

6 It is another object of this invention to provide means for covering a gap below a
7 garage door that prevents intrusion by pests.

8 It is another object of this invention to provide means for covering a gap below a
9 garage door that can create a ventilated indoor play area for small children and pets while
10 confining them and preventing them from wandering into danger outside the garage.

11 It is yet another object of this invention to provide means for covering a gap below a
12 garage door that is inexpensive and easy to install.

13 It is yet another object of this invention to provide means for covering a gap below a
14 garage door that does not attach to the movable garage door itself, nor to the floor below it.

15 The foregoing and other objects of this invention are achieved by providing a net
16 adapted to stretch across the entire width of a garage doorway to cover a vertical portion of
17 the doorway. The net comprises an open weave web portion having a closed weave border.
18 Two brackets mounted one on each side of the doorway near the floor include lugs spaced
19 above the garage floor. Straps extend from the bottom and top portions of the border toward
20 the brackets and loop through the lugs and back onto themselves where hook-and-loop
21 fasteners secure them in place. One or more intermediate straps may extend from each end
22 between the top and bottom straps. The garage door freely passes in front of the net to close
23 the doorway as normal.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of the present invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use and further objects and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

Figure 1 is a front elevation view of a garage, as seen from outside in the driveway, depicting the present invention installed in the doorway.

Figure 2 is a rear elevation view, as seen from inside the garage, of the present invention installed on the garage doorway of Figure 1.

Figure 3 is a partial top plan view of the present invention, as indicated in Figure 2.

Figure 4 details in perspective one end of the invention installed as in Figures 1 and 2.

Figure 5 details one end of the net portion of the present invention before installation.

Figures 6 and 7 are front and side views respectively of the wall bracket of the present invention.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

With reference now to the figures, and in particular to Figures 1 - 4, garage 1 comprises wall 2 having doorway opening 4 extending across a driveway which typically provides access into the interior of garage 1 through opening 4. Garage door 3 further comprises a plurality of horizontal, rectangular sections or panels 5 disposed one atop the next and coupled together by hinges 10. Panels 5 are supported by rollers 9 which travel

1 within rails 7 extending on either side of opening 4 inside garage 1. Rails 7 are supported by
2 mounting brackets 8 attached to the inside of wall 2.

3 Some garage doors 3 may be operated by electric garage door openers (not shown)
4 adapted automatically or manually to raise and lower door 3. Such door openers typically
5 may be operated to stop the door manually at any point along its path of travel, leaving a gap
6 beneath bottom edge 6 of bottom panel 5. The operator of the garage door opener can control
7 the height of this opening by stopping the opener accordingly. Such openers often include
8 sensors 11 mounted near floor 13 on either side of doorway 4 which detect obstructions and
9 prevent door 3 from closing until the obstruction is removed.

10 As seen best in Figures 3 and 4, net 20 is stretched horizontally across opening 4
11 behind the gap below panel edge 6 to cover substantially all of opening 4 not covered by door
12 3. Net 20 extends vertically to a height H shown to be substantially the height of the gap
13 below door 3. One having ordinary skill in the art will recognize, however, that the size of
14 this gap is arbitrary, and could be a fraction or multiples of height H without departing from
15 the spirit and scope of the present invention. Nevertheless, a typical installation would
16 contemplate the gap beneath edge 6 being substantially equivalent to height H, with perhaps
17 a small amount of overlap between the top of net 20 and edge 6.

18 Net 20 further comprises screen 21 surrounded by border 23 to form a rectangle
19 having a longitudinal axis substantially parallel to and extending the length of opening 4.
20 Thus, net 20 is sized at least to cover the horizontal width of opening 4 to a height H above
21 floor 13.

22 Screen 21 comprises one of a variety of open web, woven materials having apertures,
23 defined by strands of material, that are smaller than anticipated pests such as insects yet open
24 enough to admit satisfactory amounts of air and/or light. A suitable screen 21 material is
25 PetScreen, a strong fiberglass screen available from Phifer Wire Products, Inc., of
26 Tuscaloosa, Alabama (www.phifer.com). Border 23 comprises one of a variety of closed
27 web woven materials having sufficient tensile strength to withstand substantial tugging to
28 tighten net 20 across opening 4. A suitable border 23 material is All Weather
29 Indoor/Outdoor Canvas available from John Boyle & Co. of Grand Prairie, Texas

1 (www.johnboyle.com). Net 20 also may include one or more vertical braces 24, preferably
2 comprising additional material from which border 23 is composed.

3 Referring now also to Figure 5, straps 25 overlap a portion of border 23 and form
4 elongate belts which extend horizontally beyond the perimeter of net 20 defined by border
5 23. Straps 25 overlap border 23 such that they extend substantially as far as the last brace 24
6 disposed at the ends of net 20. The figures depict three (3) straps 25, top and bottom straps
7 25 being superimposed along a portion of border 23 itself, while middle strap 25 crosses
8 border 23 to couple to both braces 24. One having ordinary skill in the art will recognize that
9 fewer or more middle straps 25 may be employed within the spirit and scope of the present
10 invention. Middle strap 25 extends only across braces 24, thereby minimizing its obstruction
11 to the opening covered by screen 23. Straps 25 further include hook-and-loop fastening
12 means 26 along at least a portion of their length. As discussed below, straps 25 are adapted
13 to loop through lugs 33 on brackets 30 and to be drawn tight and lapped back onto
14 themselves where fasteners 26 hold them in place, thereby securing net 20 in place.

15 Referring now also to Figures 6 and 7, brackets 30 mount to wall 2 on either side of
16 opening 4 to hold net 20 in place. Each bracket 30 comprises elongate base 31 secured to
17 wall 2 by lag screws 35 or other convenient attachment means. Bases 31 are disposed
18 substantially vertically, paralleling the side of opening 4. They are mounted a spaced
19 distance away from the sides of opening 4 of wall 2 and farther away from opening 4 than
20 rail brackets 8. One having ordinary skill in the art will recognize that brackets 30 may be
21 mounted in any number of alternate locations, such as on a side wall adjacent to wall 2 (not
22 shown), as long as they are disposed near opening 4, farther away therefrom than rails 7 and
23 at least as close to wall 2 as rails 7. The reason for this last constraint will be clear from the
24 detailed discussion below. Brackets 30 preferably comprise rigid material such as steel,
25 aluminum, suitably malleable but of sufficient strength to withstand necessary tension from
26 straps 25 without bending. Preferably, bases 31 are one fourth (1/4 " - 3/16") to three-
27 sixteenths inch thick if made of steel.

28 Lugs 33 extending from bases 31 are spaced along its vertical length such that their
29 number and mounting height substantially matches the number and height of straps 25. Lugs

33 comprise metal rods bent and attached by each end to base 31 to form a substantially U-shaped or rectangular opening oriented substantially vertically. Lugs 33 preferably comprise metal rods such as steel reinforcing bar or U-bolts one fourth (1/4 " - 3/16") to three-sixteenths inch in diameter, coupled to bases 31 at both ends and disposed substantially perpendicular to bases 31. Though shown in the figures as such closed loops, lugs 33 could comprise alternate structures, such as loops that extend from bases 31 at an angle (not shown) or structures (e.g. hooks) which do not form a closed loop (not shown) between two points on base 31. One having ordinary skill in the art will recognize that all such alternatives are considered to be within the spirit and scope of the present invention.

Net 20 mounts across opening 3 such that either straps 25 or a portion of net 20 itself partially wraps around the interior edge (disposed toward the interior of garage 1) of rail 7. This has at least two benefits. First, it causes straps 25 to approach lugs 33 at least partially in alignment with them, such that tension pulled into straps 25 does not pull on lugs 33 at an acute angle relative to perpendicular to base 31. This minimizes cantilever loading on lugs 33 and minimizes the chance they will bend toward opening 3 and relax the tension in net 20, thereby causing net 20 to sag after installation. Second, the tension pulls net 20 tight against rails 7, thereby securing it best in front of opening 4. Further, since net 20 thereby passes behind the interior edge of rail 7, it does obstruct door 3, which rides on rollers 9 within rails 7. Net 20 thus does not impeded closing of door 3, which may pass in front of net 20 until edge 6 of bottom panel 5 engages floor 13, eliminating the gap beneath edge 6. Net 20 can remain in place with door 2 closed in case the operator wishes to restore the gap. When the operator needs to pass vehicles through opening 4, net 20 may be removed as discussed below.

In operation, the operator lays net 20 across the floor of garage 1 substantially parallel wall 2, with fasteners 26 disposed toward the interior of garage 1. Straps 25 on one end of net 20 then are looped through corresponding lugs 33 of brackets 30 on one side of opening 4 and secured with fasteners 26, as depicted in Figures 2 - 4. Straps 25 enter lugs 33 from their side closest to opening 4 and exit lugs 33 away from opening 4. They then are pulled back toward net 21 to overlap themselves, whereupon fasteners 26 secure them in place. Next, the operator loops straps 25 on the opposite end of net 20 through lugs 33 in like fashion on the

1 other bracket 30. The operator then tightens this second set of straps 25 one at a time until he
2 is satisfied with the appearance and integrity of net 20 across opening 4. Preferably, the
3 operator pulls tension in straps 25 one at a time until no significant sag is observable in net
4 20.

5 Uninstalling net 20 requires simply reversing the above steps. The operator releases
6 fasteners 26 on straps 25 at one end of net 20 and pulls straps 25 through and out of lugs 33.
7 He allows net 20 to sag to floor 13 while he removes in like manner straps 25 from bracket
8 30 on the other side of garage 1. He then may roll up or fold net 20 for storage. Alternately,
9 he may leave straps 25 in place on bracket 30 at one side of garage 1 while rolling up net 20
10 and storing it beside opening 4 near rail 7. Or, he simply may pull net 20 out of the way,
11 beside a side wall (not shown) adjacent wall 2. The foregoing steps of installing and
12 uninstalling net 20 may be performed with door 3 either open or closed.

13
14 The present invention, described in its preferred embodiment, thus serves to cover
15 part or all of a gap formed across opening 4 below door 3 when door 3 is partially closed.
16 Net 20 is not intended to be insect proof, but one having ordinary skill in the art will
17 recognize that it will discourage pests, especially flying ones such as birds or insects, from
18 entering garage 1. Net 20 also can be employed to confine small children or pets within
19 garage 1 while admitting substantial air and light. Net 20 likewise can prevent many larger
20 animals, such as neighbors' pets or children, from entering garage 1 while door 3 is partly or
21 entirely open. When the operator chooses to fully open door 2 while net 20 is in place, net 20
22 serves as a fence of height H across doorway 4.

23 While the invention has been particularly shown and described with reference to one
24 or more embodiments, it will be understood by those skilled in the art that various changes in
25 form and detail may be made therein without departing from the spirit and scope of the
26 invention. For example, net 20 has been depicted and described as being substantially the
27 vertical height of a single panel 5 of door 3, and that the gap contemplated would be of
28 comparable size. Net 20 could, however, be any practical size, including substantially as
29 large as door 3 so to cover the entire opening 4. This would require proportionately more
30 straps 25 because of the increased height H of net 20, and certainly would require longer

1 brackets 30 and more lugs 33 mounted correspondingly as high as straps 25. Also, brackets
2 30 have been depicted as a single unit of convenient size, but lugs 33 could be mounted
3 directly to wall 2 or other stationary objects without first being attached to bases 31. Further,
4 straps 25 have been depicted as comprising the same or similar web material as border 23,
5 but they could comprise other strap means such as elastic, self-tensioning material
6 (sometimes known as “bungee cords”) or twine or rope, either permanently attached to border
7 23 or adapted to be coupled to border 23 to grommets or other structures (not shown) within
8 border 23. Likewise, fastener means 26 has been described as hook-and-loop fasteners, but
9 could instead be other fasteners, such as buttons, snaps or metal hooks (not shown) adapted
10 to cooperate with one of a plurality of appropriately corresponding fixtures (not shown)
11 disposed along straps 25 and/or border 23.

12 Still further, net 20 has been depicted as spanning a single doorway 4 and door 3
13 which substantially fill wall 2 of garage 1. Such garage doors are considered “double car”
14 doors, meaning that two standard-width automobiles may enter opening 4 side by side. It is
15 not unusual, however, for wall 2 to include one or more (most typically two) such garage
16 doors filling its width (not shown) in lieu of a single door, each such door capable of
17 admitting a single car (hence, known as “single car” garage doors), whereby two or more
18 automobiles still may enter garage 1 through wall 2, but through separate, side-by-side doors.
19 A short, intermediate section (not shown) of wall 2 typically is disposed between said single
20 car doors to provide anchorage for rails 7 on the sides of each single car doorway proximate
21 the other doorway. Rails 7 on the opposite sides of each single car doorway, distal said
22 intermediate section of wall 2, would be substantially as described above for double car
23 garage door 3.

24 In such case, the owner/operator may employ the present invention in two alternate
25 ways. First, net 20 may be sized (in horizontal length) to fit a single car doorway, thereby
26 being approximately half the length of net 20 as described above. In all other ways, net 20
27 would be substantially as described above for double car doorway 4, including two brackets
28 30, one on either side of each single car doorway. For a two car garage, two nets 20, with
29 corresponding brackets 30 mounted on either side of each single car doorway, each could
30 serve one of the two single car doors independently. Alternately, net 20 as described above

1 in the preferred embodiment, capable of spanning double car garage doorway 4, still could be
2 employed to span both single car doorways without substantial modification. Net 20 would
3 couple to brackets 30 and bear against rails 7 distal said intermediate section of wall 2 as
4 described above. Net 20 also would pass behind rails 7 proximate said intermediate section
5 of wall 2, optionally being attached thereto by support means between proximate rails 7 and
6 upper border 23, thereby further controlling sag in net 20. Such intermediate support means
7 could comprise a small patch of hook-and-loop fastener disposed on border 23 and rail 7 (not
8 shown), or it could comprise clamps or other apparatus (not shown) independent of net 20
9 but adapted to grasp and hold it as needed. In either case, the presence of multiple single car
10 garage doors would provide the flexibility to create a gap in wall 2 beneath only one door,
11 the gap thereby being only a portion of the width of wall 2.

12 Further, though the present invention has been described in the context of garage
13 doors having rails 7, it also could be used in any doorway context, such as Dutch doors which
14 are split top-to-bottom and which bottom section may be opened independently of the top.
15

16 Finally, though the present invention has been described as being permeable to both
17 light and air, it could be impermeable to one or the other or both. For example, screen 21
18 could comprise an air impermeable but light permeable material such as polyethylene film,
19 making net 20 useful in wintertime for admitting light into garage 1 but not permitting air
20 exchange. This option also could be useful for creating temporary greenhouses on patios for
21 wintering of weather-sensitive plants. Alternately, screen 21 could comprise multiple layers
22 of web material so overlapped that the strands block light sufficiently to prevent anyone from
23 seeing through net 20 while admitting sufficient air to ventilate garage 1. This option also
24 could be useful for creating a visual screen for a patio, hot tub, deck or other area without
25 unnecessary stifling of desirable breezes.